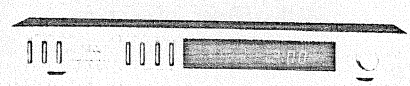
PIONEER

Service Manual

CIRCUIT DESCRIPTIONS REPAIR & ADJUSTMENTS



ORDER NO.
ARP-333-0

AUDIO DIGITAL TIMER

DT-540

MODEL DT-540 COMES IN SIX VERSIONS DISTINGUISHED AS FOLLOWS.

Type	Voltage	Remarks
KU	AC120V only	U.S.A. model
S	AC110V, 120V, 220V, 240V (switchable)	General export model
S/G	AC110V, 120V, 220V, 240V (switchable)	U.S. Military model
NE	AC220V only	European continent model
YB	AC240V only	United Kingdom model
YP	AC240V only	Australia model

- This service manual is applicable to the NE, YP types.
  For servicing of the other types, please refer to the Additional Service Manual.

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PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS (USA) INC. 1925 E. Dominguez St., Long Beach, California 90810 U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

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1. SPECIFICATIONS

Time display ..... Digital display with fluorescent display tube
Timer type ..... 24-hour type (24-hour display)
Timer setting ...Only one ON/OFF time setting in minimum units of minutes within a 24-hour period
Sleep timer .....Setting in minimum units of minutes up to 1 hour 59 minutes
Time accuracy .....Synchronized with line frequency
Timer accuracy .....Within ± 0.1 sec. of time displayed
Sleep timer accuracy .....Within 59 sec. of set time

Power section, others

Power requirements ..... a.c. 220 volts~, 50 Hz
AC outlet capacity power ..... 500 W max. (inductive load)
Power consumption ..... 6 W

Other functions

- AC OUTLET "on" display (red LED lights)
- Timer operation display (green LED lights)
- Power failure display (time display winks)

Dimensions ..... 420 (W) x 52 (H) x 144 (D) mm
16-9/16 (W) x 2 (H) x 5-11/16 (D) in
Weight ..... 1.7 kg (3 lb 12 oz)

Accessories

Operating Instructions (English/German/French/Italian) 1

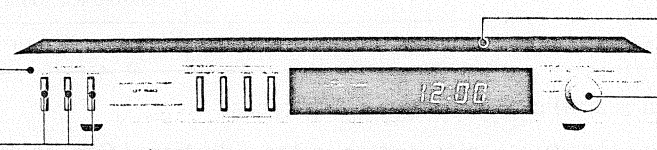
NOTE:
Specifications and design are subject to possible modification without notice due to improvements.

2. PARTS LOCATIONS

NOTES:

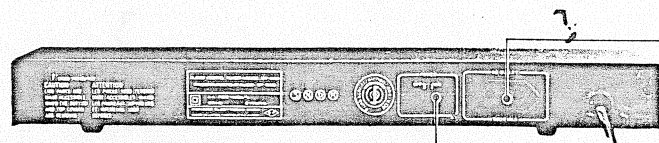
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Front Panel



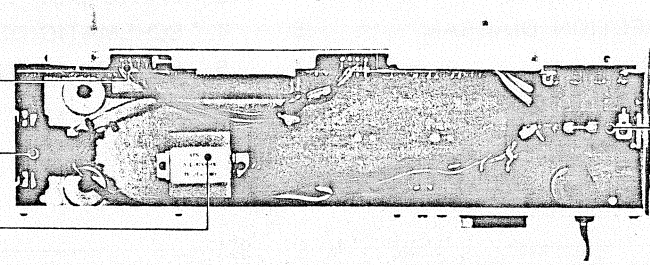
Bonnet case ANE-313
Front panel assembly ANM-404
Push knob AAD-251
Knob AAB-339

Rear Panel



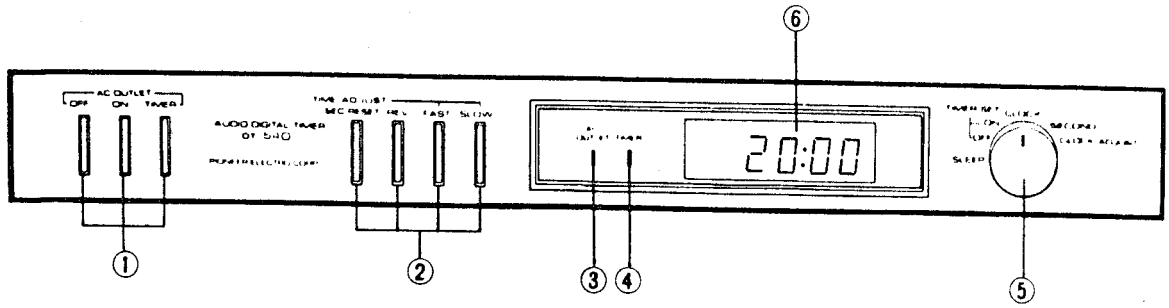
⚠ AC socket AKP-026
⚠★★ Slide Switch ASH-501
⚠ AC power cord ADG-068

Top View with Bonnet Removed



Timer assembly GWX-895
⚠★★ Relay ASR-506
⚠★ Power transformer ATS-012
Switch assembly GWS-255

3. FRONT PANEL FACILITIES



① AC OUTLET SELECTORS

These switch on and off the power flowing to the rear panel AC OUTLET.

OFF: Used to switch off the power of the connected audio components regardless of the timer operation (set times).

ON: Used to switch on the power of the connected audio components regardless of the timer operation (set times).

TIMER: Used to switch ON and OFF the power of the connected audio components with the timer operation.

② TIME ADJUST SWITCHES

These are used to adjust the time/displayed times in line with the setting of the mode selector.

SEC RESET: When this switch is depressed with the mode selector in the SECOND position, the second display of the present time is reset to 0:00 and when released the seconds are counted up from 0:00 → 0:01 → 0:02 → etc., and the rightmost minute digit and seconds are displayed.

REV: When the FAST or SLOW switch is depressed while this switch is in the depressed position, the displayed time is reversed rapidly or slowly. (This function does not work when the sleep timer function is set.)

FAST: When this switch is depressed, the displayed time is forwarded rapidly.

SLOW: When this switch is depressed, the displayed time is forwarded slowly.

③ AC OUTLET INDICATOR (red)

This lights when power is being supplied to the AC OUTLET on the rear panel.

④ TIMER INDICATOR (green)

This lights when the AC OUTLET-TIMER selector is depressed.

5 MODE SELECTOR

This is used to select the timer's function.

SLEEP: Used to set the operating time (1 minute to 1 hour 59 minutes) until the power of the audio components operating is to be set OFF.

TIMER SET-OFF: Used to set the time at which the power to the connected audio components is set OFF.

TIMER SET-ON: Used to set the time at which the power to the connected audio component is set ON.

CLOCK: Used to display the present time (hours & minutes).

SECOND: Used to adjust the seconds of the present time and check the seconds of the present time.

CLOCK ADJUST: Used to adjust the clock to the present time.

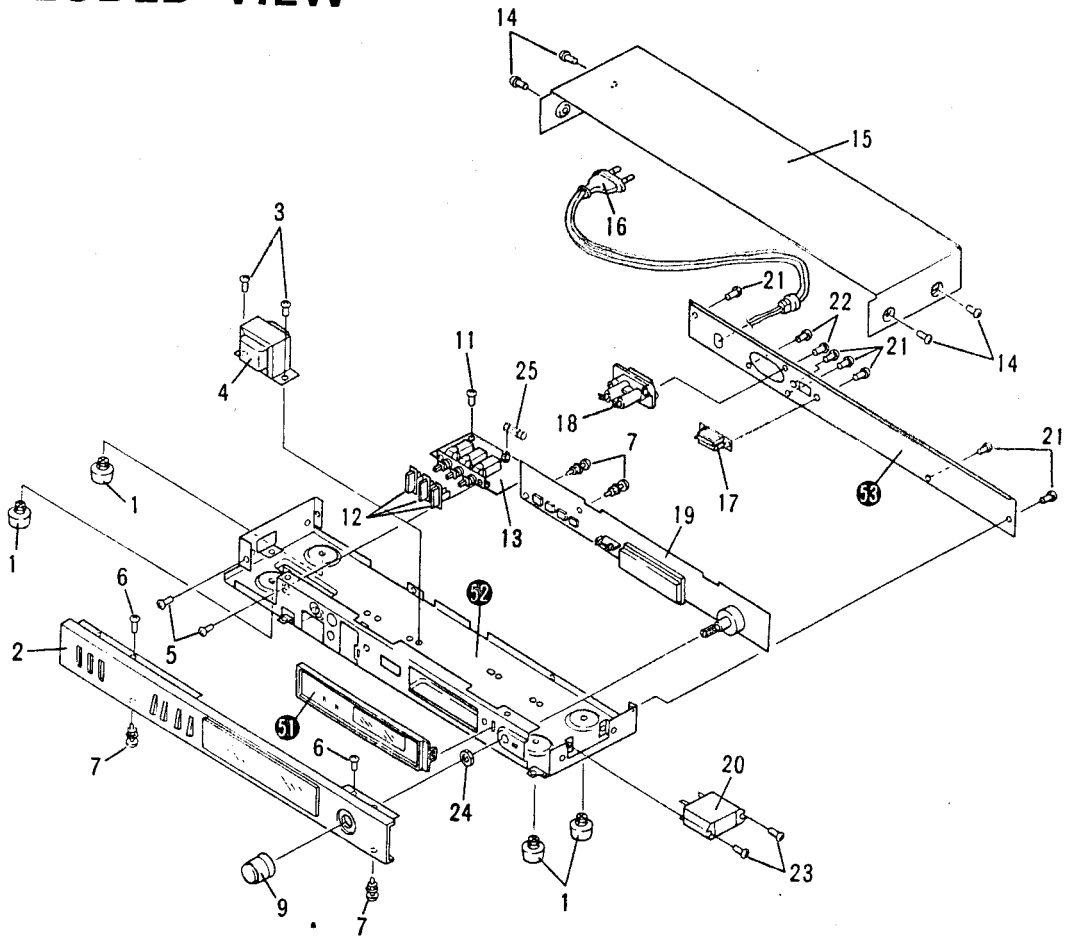
⑥ TIME DISPLAY

The time is displayed as it relates to the mode selector or TIME ADJUST switch settings in the following table.

Mode selector	TIME ADJUST switch	Display	Example of display
SLEEP	FAST SLOW	Time until sleep operation is due to go OFF.	1:30 1 hr 30 min.
TIMER SET-OFF	FAST SLOW REV	Display of OFF time set by timer.	AM 8:00 AM 8 hr 00 min.
TIMER SET-ON	FAST SLOW REV	Display of ON time set by timer	AM 7:30 AM 7 hr 30 min.
CLOCK	—	Display of present time	PM 5:38 PM 5 hr 38 min.
SECOND	—	Display of seconds and rightmost digit of present time minute	8:25 8 min. 25 sec.
	SEC RESET	Display for adjusting seconds correctly of present time	5:00 5 min. 00 sec.
CLOCK ADJUST	FAST SLOW REV	Display for adjusting hours and minutes of present time	PM 12:05 PM 12 hr 5 min.

NOTE:
When the unit's power plug is connected to a household AC outlet, the "AM 12:00" or "0:00" time display will wink. It also winks when there has been a power failure while the unit was working and the power has been restored.

4. EXPLODED VIEW



NOTES:

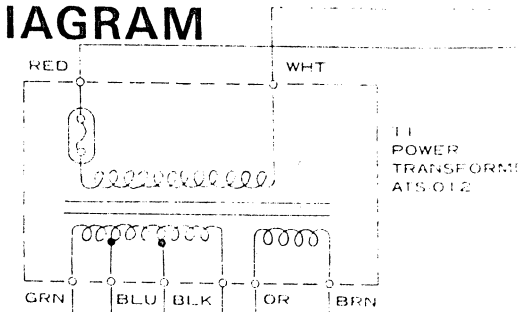
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Parts List

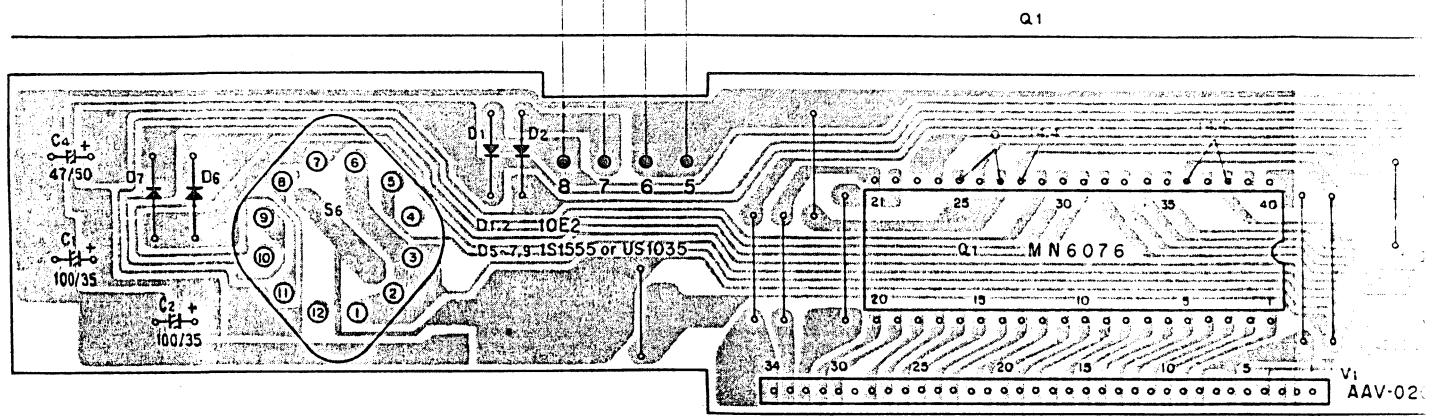
Mark	No.	Part No.	Description
	1.	AEC-903	Foot assembly
	2.	ANM-404	Front panel assembly
	3.	VBZ30P060FMC	Screw
⚠	★ 4.	ATS-012	Power transformer (T1)
	5.	PMZ30P060FZB	Screw
	6.	BCZ30P080FMC	Screw
	7.	AEC-510	Nylon rivet
	8.		. . . . .
	9.	AAB-339	Knob
	10.		. . . . .
	11.	VBZ30P060FMC	Screw
	12.	AAD-251	Push knob
	13.	GWS-255	Switch assembly
	14.	BBT30P080FZK	Screw
	15.	ANE-313	Bonnet case

Mark	No.	Part No.	Description
⚠	16.	ADG-068	AC power cord
⚠	★★ 17.	ASH-501	Slide switch (S7)
⚠	18.	AKP-026	AC socket (AC OUTLET)
	19.	GWX-895	Timer assembly
⚠	★★ 20.	ASR-506 (ASR-501)	Relay
	21.	BBT30P080FZK	Screw
	22.	MTZ30P100FZK	Screw
	23.	VBZ30P060FMC	Screw
	24.	NK90FUC	Nut
⚠	★★ 25.	AEK-403	Fuse T2.5A
	51.		Sub-panel
	52.		Chassis
	53.		Rear panel

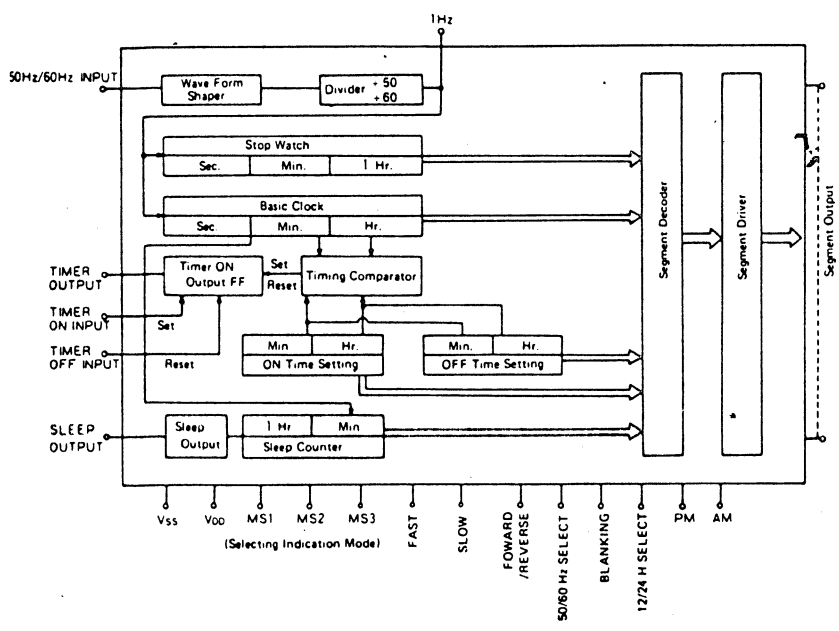
5. P.C. BOARD CONNECTION DIAGRAM



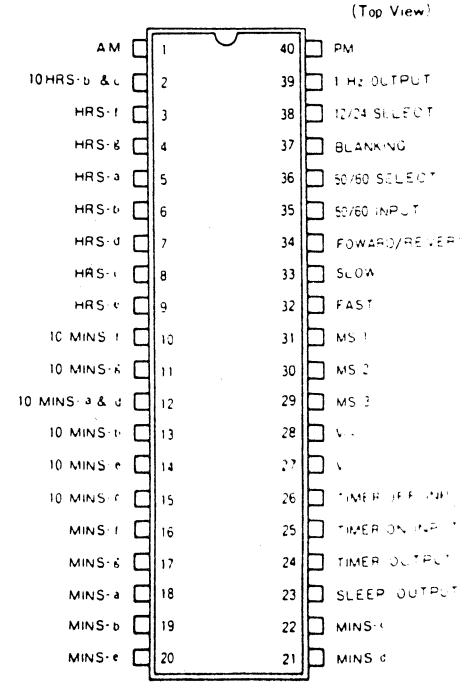
TIMER Ass'y (GWX-895)

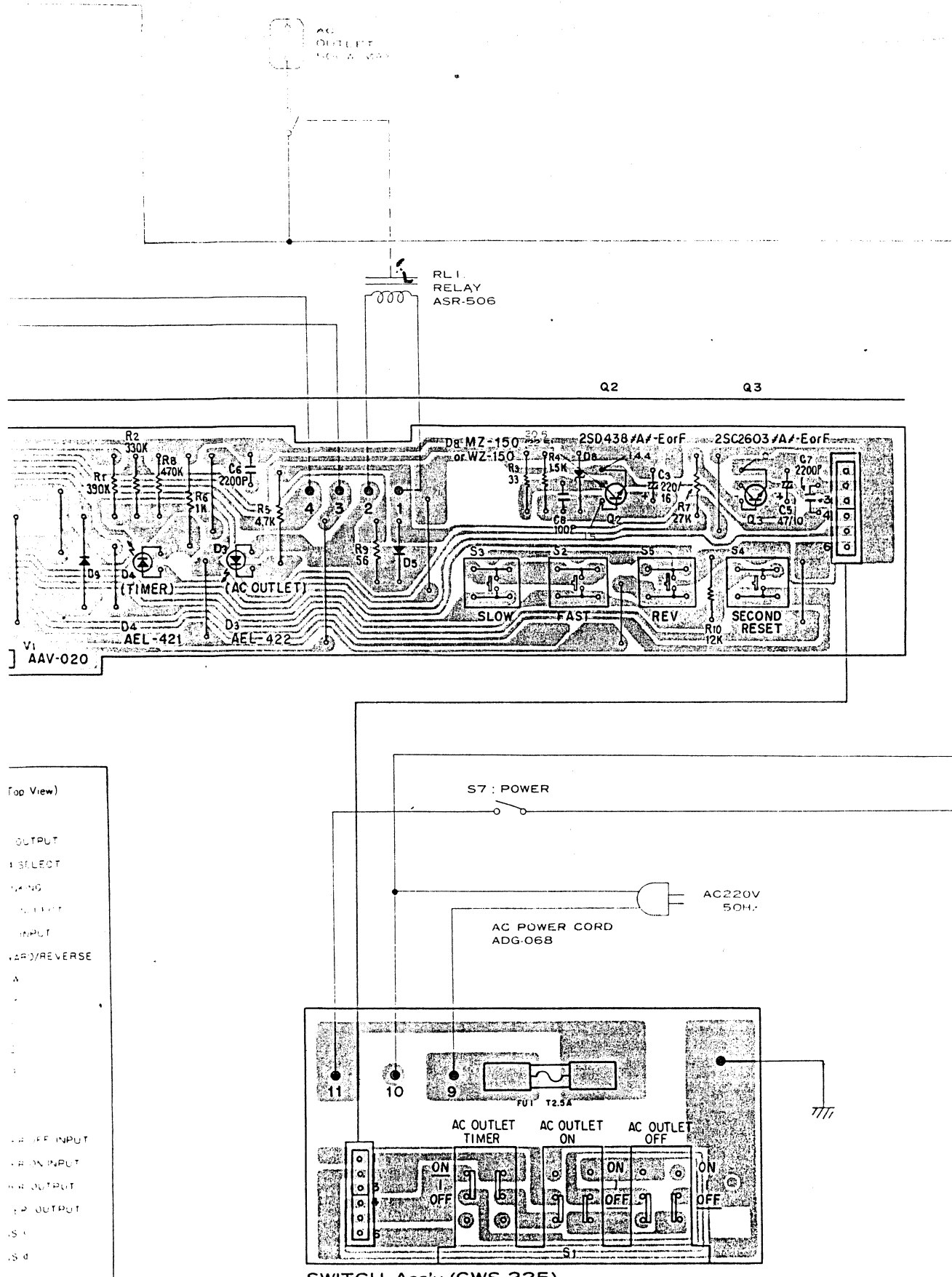


MN6076



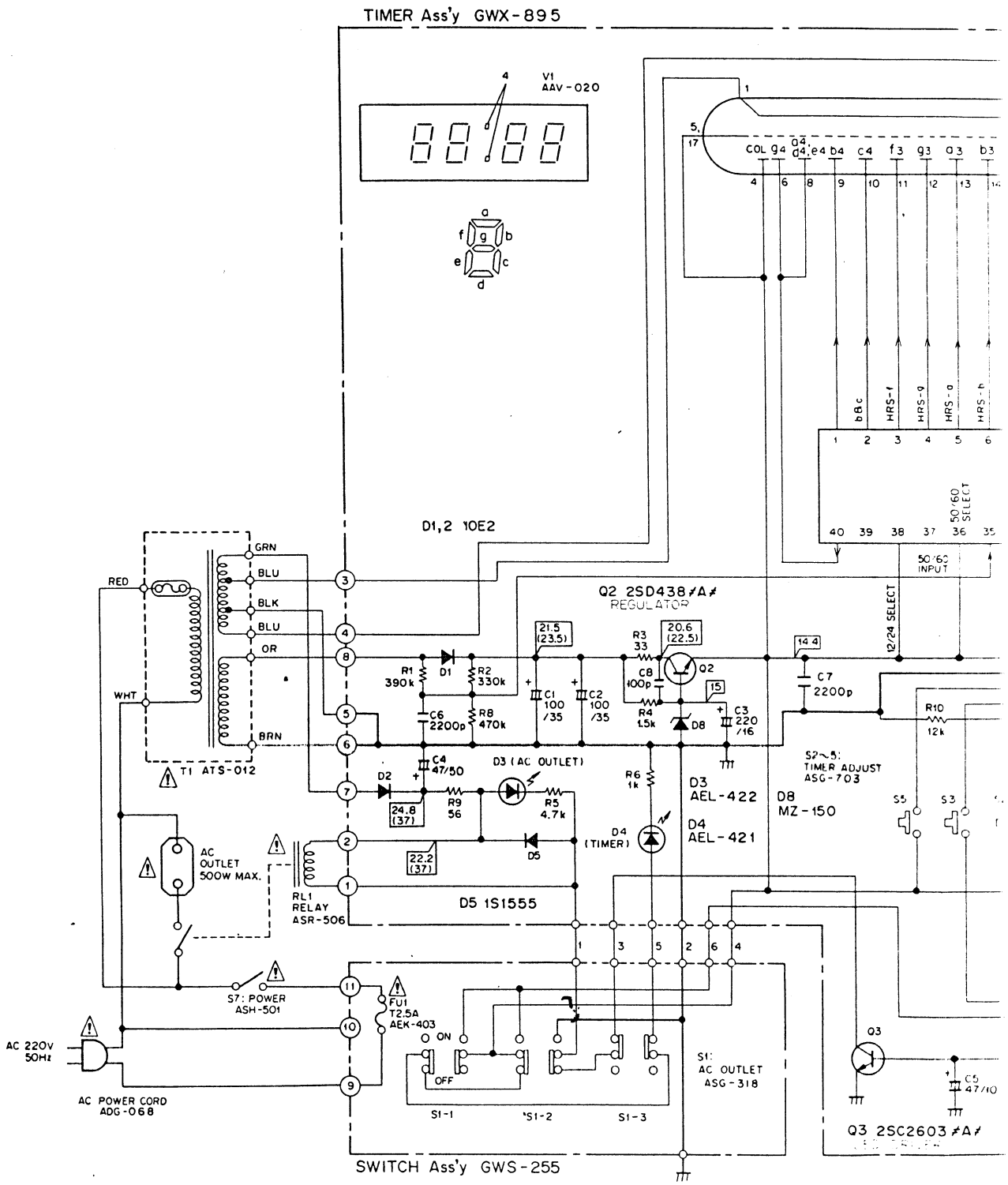
(Top View)

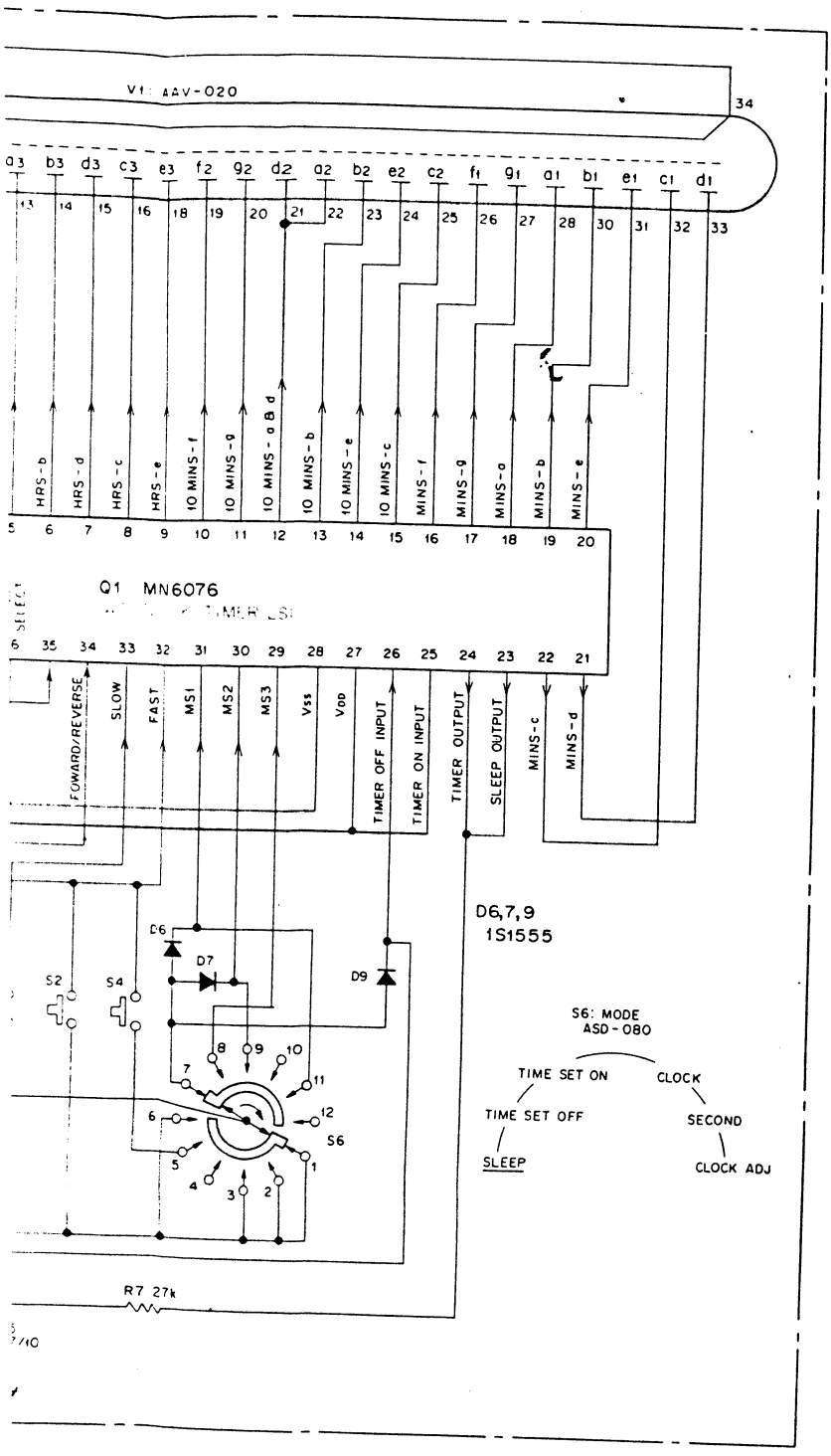




SWITCH Ass'y (GWS-225)

6. SCHEMATIC DIAGRAM





1. RESISTORS:
Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10%tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE
: DC voltage (V) at TIMER, RELAY ON.
Value in ( ) is DC voltage at AC OUTLET OFF.

4. OTHERS:
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

SWITCHES:

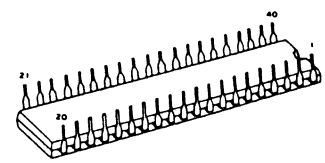
S1-1	AC OUTLET (OFF)	ON – OFF
S1-2	AC OUTLET (ON)	ON – OFF
S1-3	AC OUTLET (TIMER)	ON – OFF
S2	TIME ADJUST (FAST)	ON – OFF
S3	TIME ADJUST (SLOW)	ON – OFF
S4	TIME ADJUST (SEC RESET)	ON – OFF
S5	TIME ADJUST (REV)	ON – OFF
S6	MODE	
	SLEEP – TIMER SET OFF – TIMER SET ON – CLOCK – SECOND – CLOCK ADJUST	
S7	POWER	ON – OFF

The underlined indicates the switch position.

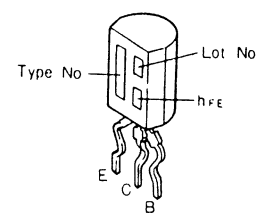
This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

Appearance of Transistors and ICs

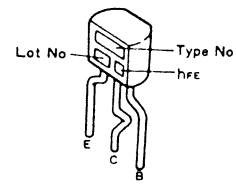
MN6076



2SD438/A/



2SC2603/A/



7. PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560Ω	*56 × 10¹*	*561 .....*	*RD¼PS 5 6 1 J*
47kΩ	*47 × 10³*	*473 .....*	*RD¼PS 4 7 3 J*
0.5Ω	*0R5 .....*		*RN2H 0 R 5 K*
1Ω	*010 .....*		*RS1P 0 1 0 K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621 ....*	*RN¼SR 5 6 2 1 F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts

Mark	Part No.	Symbol & Description
	GWX-895	Timer assembly
	GWS-255	Switch assembly
⚠ ★★	ASR-506 (ASR-501)	Relay
⚠	ADG-068	AC power cord
⚠	AKP-026	AC socket (AC OUTLET)
⚠ ★	ATS-012	T1 Power transformer
⚠ ★★	ASH-501	S7 Slide switch (POWER)
⚠ ★★	AEK-403	FU1 Fuse T2.5A

7.1 TIME ASSEMBLY (GWX-895)

SEMICONDUCTORS.

Mark	Part No.	Symbol & Description
★★	MN6076	Q1
★★	2SD438/A/	Q2
★★	2SC2603/A/	Q3
★	10E2	D1, D2
★	IS1555 (US1035)	D5–D7, D9
★	MZ-150 (WZ-150)	D8
★	AEL-422	D3 LED (AC OUTLET)
★	AEL-421	D4 LED (TIMER)

SWITCHES

Mark	Part No.	Symbol & Description
★★	ASG-703	S2–S5 Tact switch (TIME ADJUST)
★★	ASD-080	S6 Rotary switch (MODE SELECTOR)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 101M 35L	C1, C2
	CEA 221M 16L	C3
	CEA 470M 10L	C5
	CEA 470M 50L	C4
	CKDYB 222K 50	C6, C7
	CCDSL 101J 50	C8

RESISTORS

NOTE: When ordering resistors, convert the resistance valu into code form, and then rewrite the part no. as before

Mark	Part No.	Symbol & Description
	RD¼PM □ □ □ J.	All resistors

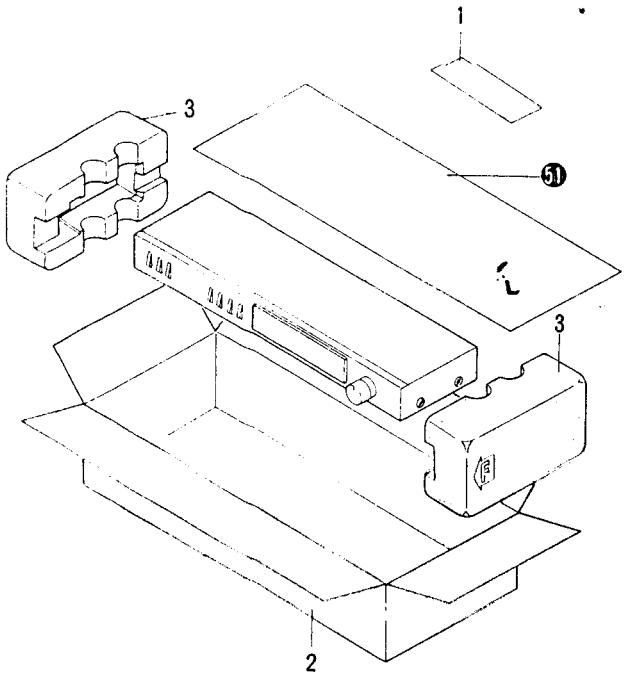
OTHERS

Mark	Part No.	Symbol & Description
★	AAV-020	V1 Fluorescent indicator tube

7.2 SWITCH ASSEMBLY (GWS-255)

Mark	Part No.	Symbol & Description
	ASG-318	S1 Push switch (AC OUTLET)

8. PACKING



Parts List

Mark	No.	Part No.	Description
	1.	ARE-072	Operating instructions
	2.	AHE-197	Packing case
	3.	AHA-256	Side pad
	51.		Sheet

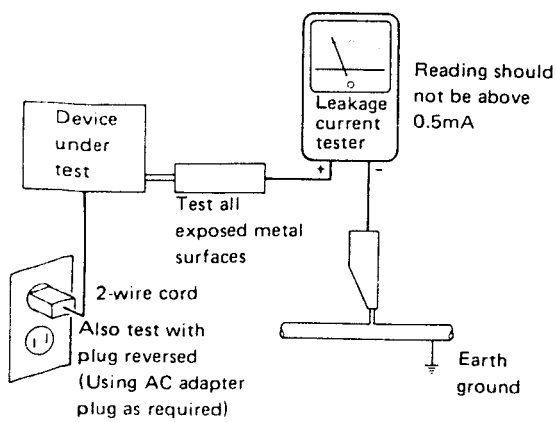
9. SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service tecnician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Device under test
Leakage current tester
Reading should not be above 0.5mA
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

ADDITIONAL

Service Manual

PIONEER

AUDIO DIGITAL TIMER

DT-540 YP

1. CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- *Parts without part number cannot be supplied.*
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Mark	Symbol & Description	Part No.		Remarks
		NE type	YP type	
	Timer assembly	GWX-895	GWX-914	
⚠ ★★	FU 1 Fuse T2.5	AEK-403	.....	
⚠ ★★	S7 Slide switch (POWER)	ASH-501	.....	
⚠ ★	T1 Power transformer (220V)	ATS-012	.....	
⚠ ★	T1 Power transformer (240V)	.....	ATS-029	
⚠	AC socket (AC OUTLET)	AKP-026	.....	
⚠	AC outlet	.....	AKP-511	
⚠	AC inlet	.....	AKP-008	
⚠	AC power cord	ADG-068	.....	
⚠	AC power cord assembly	.....	ADG-074	
	Front panel assembly	ANM-404	ANM-436	
	Operating instruction	ARE-072	ARB-565	

2. SPECIFICATIONS

Time display ..... Digital display with fluorescent display tube
Timer type ..... 24-hour type
Timer setting ..... Only one ON/STAND-BY time setting in minimum unit of minutes within a 24-hour period
Sleep timer .. Setting in minimum units of minutes up to 1 hour 59 minutes
Time accuracy ..... Synchronized with line frequency
Timer accuracy ..... Within ± 0.1 sec. of time displayed
Sleep timer accuracy ..... Within 59 sec. of set time

Power section, others

Power requirements ..... a.c. 240 volts ~, 50 Hz
AC outlet capacity power · 500W max. (inductive load)
Power consumption ..... 6 W

Other functions

- AC OUTLET "on" display (red LED lights)
- Timer operation display (green LED lights)
- Power failure display (time display winks)

Dimensions ..... 420 (W) x 52 (H) x 144 (D) mm
16-9/16 (W) x 2 (H) x 5-11/16 (D) in.
Weight ..... 1.7 kg (3 lb 12 oz)

Accessory

Operating Instructions 1

Note:
Specifications and design are subject to possible modification without notice due to improvements.

3. PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

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47kΩ	*47 × 10³*	*473 . . . . .*	*RD¼PS 4 7 3 J*
0.5Ω	*0R5*	*. . . . . .*	*RN2H 0 R 5 K*
1Ω	*010*	*. . . . . .*	*RS1P 0 1 0 K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621 . . . .*	*RN¼SR 5 6 2 1 F*

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3.1 TIMER ASSEMBLY (GWX-914)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	MN6076	Q1
★★	2SD438/A/	Q2
★★	2SC2603/A/	Q3
★	10E2	D1, D2
★	IS1555 (US1035)	D5–D7, D9
★	MZ-150 (WZ-150)	D8
★	AEL-422	D3 LED (AC OUTLET)
★	AEL-421	D4 LED (TIMER)

SWITCHES

Mark	Part No.	Symbol & Description
★★	ASG-703	S2–S5 Tact switch (TIME ADJUST)
★★	ASD-080	S6 Rotary switch (MODE SELECTOR)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 101M 35L	C1, C2
	CEA 221M 16L	C3
	CEA 470M 10L	C5
	CEA 470M 50L	C4
	CKDYB 222K 50	C6, C7
	CCDSL 101J 50	C8

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD¼PM □ □ □ J.	All resistors

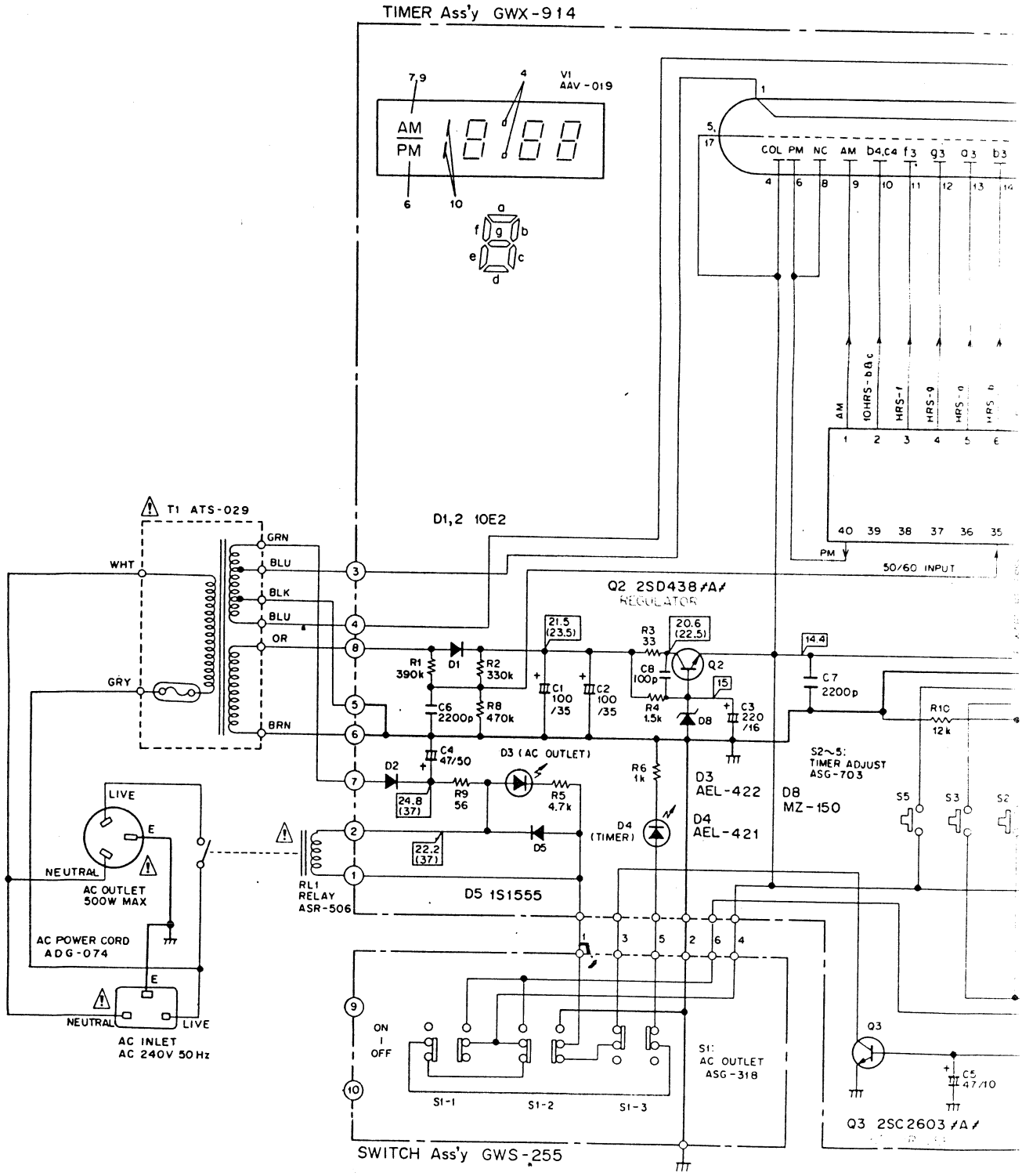
OTHERS

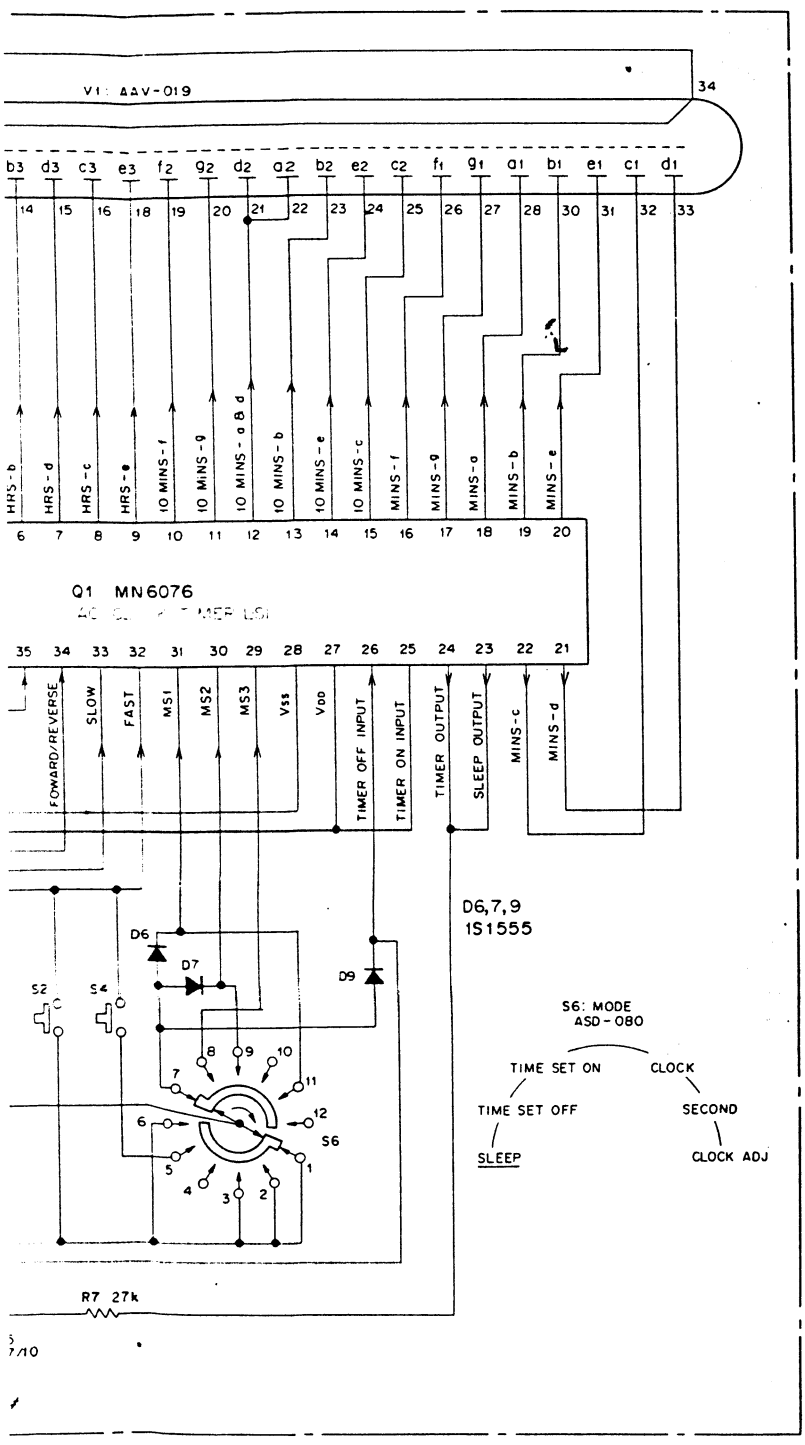
Mark	Part No.	Symbol & Description
★	AAV-019	V1 Fluorescent indicator tube

3.2 SWITCH ASSEMBLY (GWS-255)

Mark	Part No.	Symbol & Description
	ASG-318	S1 Push switch (AC OUTLET)

4. SCHEMATIC DIAGRAM





1. RESISTORS:
Indicated in Ω, ¼W, ·5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ·1%, (G) : ·2%, (K) : · 10%tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE
▭ : DC voltage (V) at TIMER, RELAY ON.
Value in ( ) is DC voltage at AC OUTLET OFF.

4. OTHERS:
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

SWITCHES:

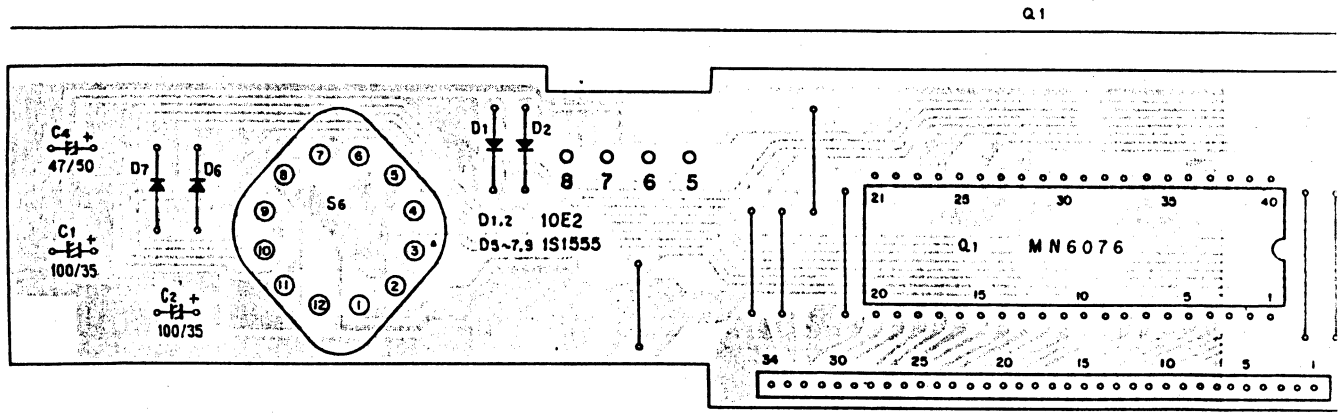
S1-1 : AC OUTLET(OFF) ON – OFF
S1-2 : AC OUTLET (ON) ON – OFF
S1-3 : AC OUTLET (TIMER) ON – OFF
S2 : TIME ADJUST (FAST) ON – OFF
S3 : TIME ADJUST (SLOW) ON – OFF
S4 : TIME ADJUST (SEC RESET) ON – OFF
S5 : TIME ADJUST (REV) ON – OFF
S6 : MODE
SLEEP – TIMER SET OFF – TIMER SET ON – CLOCK – SECOND – CLOCK ADJUST

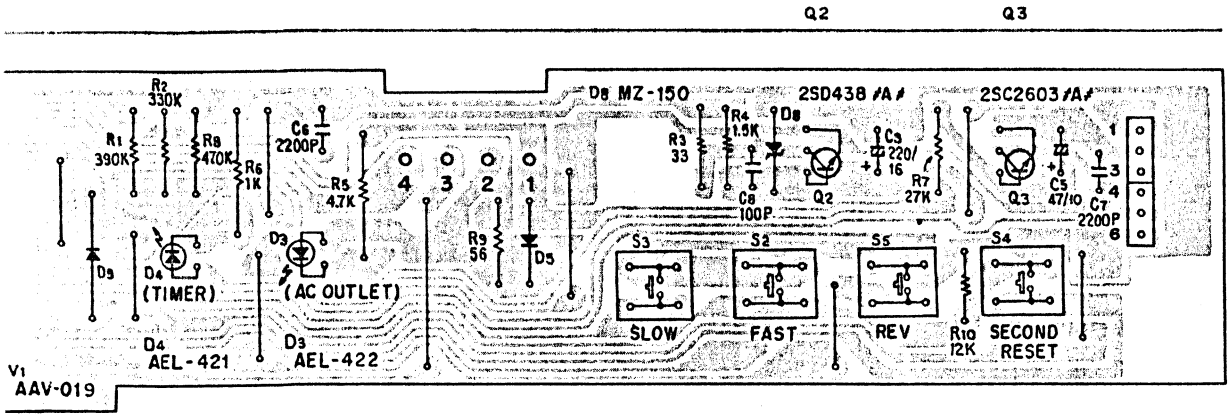
The underlined indicates the switch position.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. P.C. BOARD PATTERN

Timer assembly




Q2
Q3
D8 MZ-150
2SD438 /A/
2SC2603 /A/
R2 330K
R1 390K
R8 470K
R6 1K
C6 2200P
R5 4.7K
4
3
2
1
R9 56
D5
R3 33
R4 1.5K
D8
C8 100P
Q2
C3 220/16
R7 27K
Q3
C5 47/10
C7 2200P
1
3
4
6
D9
D4 (TIMER)
D3
(AC OUTLET)
S3
S2
S5
S4
SLOW
FAST
REV
R10 12K
SECOND RESET
V1
AAV-019
D4 AEL-421
D3 AEL-422